

# **Department of Transportation: Bridge Foundation Inspection Practices**

Tuesday, November 22, 2011

## **Background Paper**

Today's hearing is an enquiry into the allegations made in a November 13, 2011 *Sacramento Bee* article regarding the adequacy of the construction inspections performed by Department of Transportation (Caltrans) inspectors on the foundations of bridges, including the foundation for the new east span of the Bay Bridge, and the foundations for overpasses, retaining walls, sign posts to which are attached the large signs informing drivers of distances, and other structural elements of the highway system.

In brief, the article alleges that a Caltrans inspection engineer discovered that an inspection technician, Duane Wiles, had falsified inspection data, destroyed raw data from inspections, and not properly checked the calibration of instruments used to perform the test. The article further alleges that when Brian Liebich, a transportation engineer who until recently was responsible for managing foundation testing, was told that Wiles had falsified data, he embarked upon a cover up. Seven months after the report of data falsification, Mark Willian, Liebich's supervisor, wrote a letter of reprimand to Wiles.

In addition, *the Bee* reported that Liebich used state materials and personnel to assist in the construction of a cabin on his private property near Susanville. He had employees, who work for him and on state time, transport the material to Susanville and fabricate a gate and beams for the cabin.

Only after the Bee's reporter began investigating the falsification of data in October did Caltrans fire Wiles and Liebich.

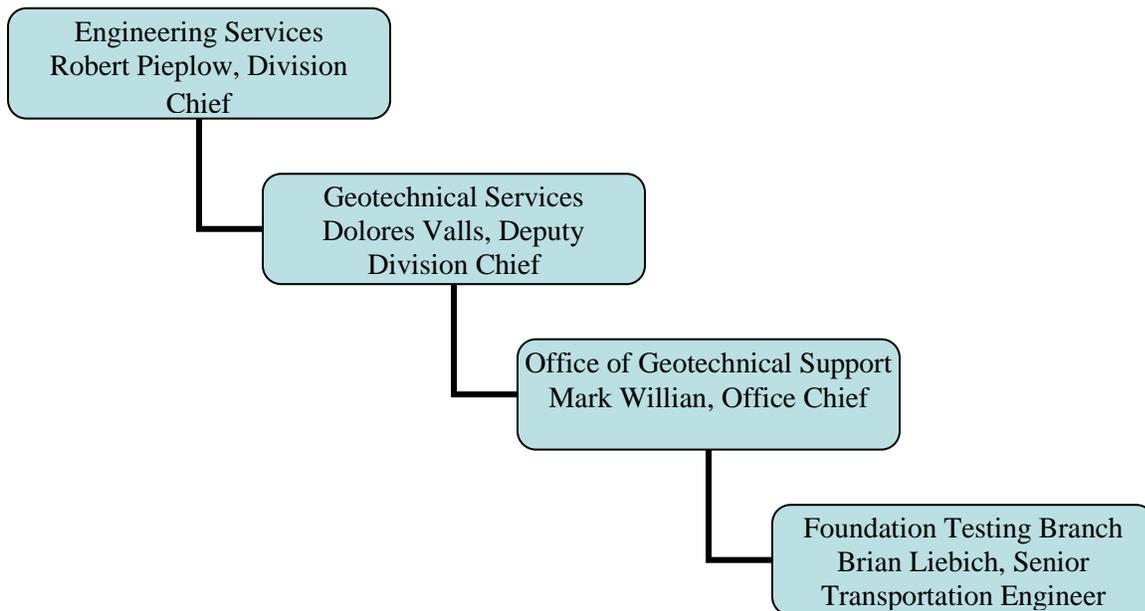
This background report will begin by providing an overview of where within the Caltrans bureaucracy foundation inspection resides and the immediate chain of command overseeing the inspection program. This is followed by a timeline of events as reported by the *Bee* and from information obtained from other sources. This report then reviews the statutes governing the

oversight of the Bay Bridge construction project and the statutes addressing the treatment of information provided by whistleblowers.<sup>1</sup>

### Organizational Location of Structural Foundation Testing Branch

The unit of Caltrans that conducts foundation inspections is in the Foundation Testing Branch, where Liebich and Wiles worked. The Branch is a unit in the Office of Geotechnical Technical Support and was headed until last week by Mark Willian. Willian reported to Dolores Valls who was deputy division chief for the subdivision of Geotechnical Services. Valls reported to the chief of the Division of Engineering Services, who during the time covered by the article was Robert Pieplow. Pieplow is now Caltrans' acting Chief Engineer.

The diagram below shows the reporting relationships at the time covered in the *Bee* article.



### Chronology of Events as Reported by the Bee

The following chronology is based on the *Sacramento Bee* article and other sources. There are gaps in the chronology, especially in regard to the transfer of Wiles out of the foundation inspection unit.

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<sup>1</sup> Caltrans provided a voluminous amount of background information on November 21, 2011 at approximately 2:30p.m. It had been agreed on November 20, 2011 that the data would be provided at 9a.m. on November 21<sup>st</sup>. The information was initially requested during a phone conversation on November 15, 2001. Unfortunately, the Caltrans information could not be used to inform this report.

1. April 2004—Construction contract awarded for the Bay Bridge foundation.
2. 2006-2007—Wiles inspects, with other inspectors, the foundation piles of the new Bay Bridge.
3. 2006-2007—Wiles either did not verify the accuracy of inspection equipment or ignored incorrect verification data.
4. January 2008—Foundation for the Bay Bridge tower completed.
5. September 2008--Caltrans foundation test engineer, Jason Wahleithner, while preparing an inspection report, found “deception” or irregularities in test data Wiles collected for an overpass in Riverside County.
6. October 2008—Another Caltrans foundation test engineer, Michael Morgan, expressed concern to Liebich about Liebich’s decision to continue allowing Wiles to perform foundation inspections given the September irregularities.
7. November 2008—Morgan does a cursory review of thousands of data files created over two years and finds additional irregularities, including falsification of data. He emails Liebich and Liebich’s boss, Mark Willian, regarding his findings.
8. January 2009—An anonymous whistle blower sends an account of the Wiles episode to the Bureau of State Audits (BSA). The BSA will not answer any questions, at least to the press, regarding the letter.
9. January 2009—Liebich emails Willian asserting Morgan’s cursory review exonerates Wiles’ work (other than the one inspection Wiles admits to falsifying) and the work of the Foundation Testing Branch that he, Liebich, manages. Liebich uses another inspection engineer, Tejinderjit Singh, to review Wiles’ work. Singh finds no other falsified data by Wiles.
10. April 2009—Willian issues Wiles a reprimand, which informs him that fabrication of analyses is an “inexcusable breach of ethics.”
11. May 2009—An anonymous whistle blower sends an account of the Wiles episode to Will Kempton, Caltrans director at the time. Kempton ask Caltrans’ division of audits and investigation to look into the allegations in the letter. The investigation begins on July 1, 2009.
12. June 2009—Wahleithner, apparently on his own initiative, continues analyzing Wiles’ reports and finds discrepancies in the foundation of a freeway sign on I-580 in Alameda County and structural components of a retaining wall on I-405 in Los Angeles.

13. June 2009-March 2010—An anonymous whistle blower sends an account of the Wiles’ episode to the Federal Highway Administration and to the Association of Drill Shaft Contractors.
14. March 2010—USDOT Office of Inspector General asks Caltrans’ audit and investigations group to “stand down” with regard to its investigation. Caltrans is required to put its investigation on hold. According to Caltrans, it also means Wiles and anyone else associated with this investigation could not be fired.
15. April 2010—Morgan in an email informs Dolores Valls, deputy division chief for Geotechnical Services, that Liebich’s exoneration of the Foundation Testing Branch is “a well-crafted misrepresentation” and that his conclusions are “unsupported by the facts.”
16. July 2010—First steel girders affixed to the Bay Bridge foundation, two- years after Caltrans had learned that Wiles had performed inspections on the foundation. This action may make it difficult to determine foundation’s integrity.
17. October 2011—*Bee* asks Caltrans about Wiles, Liebich, and the inspection issues.
18. October-November 2011—Pieplow defends Liebich in an interview with *the Bee*.
19. November 2011—Willian reassigned to direct Drilling Services Branch.
20. November 8, 2011—Caltrans places Wiles and Liebich on administrative leave.
21. November 14, 2011—Caltrans fires Willian and Liebich. Liebich is fired for misusing state property and Wiles for lying about test results. As a result of the Bee’s probe, Caltrans begins reviewing Wiles’ inspection of the foundation piles of the new east span of the Bay Bridge.
22. November 16, 2011—The Toll Bridge Oversight Committee, which oversees the construction of the new east span of the Bay Bridge, votes unanimously to convene its Seismic Safety Peer Review Committee to determine if the foundation for the tower of the new bridge is safe. The committee is chaired by Steve Heminger, executive director of the Metropolitan Transportation Commission. The other members of the committee are Bimla Rhinehart, executive director of the California Transportation Commission and Malcolm Dougherty, acting director of Caltrans.

## **Inspection Process**

The foundation testing branch performs a variety of tests on foundations intended to support a structure or another component of a highway, such as highway sign structures and retaining walls. The two nondestructive testing techniques involved in foundations discussed in the Bee

article are gamma-gamma logging and crosshole sonic logging<sup>2</sup>. In the case of the Bay Bridge, Caltrans apparently performed gamma-gamma testing and also relied on the construction contractor to perform sonic logging. According to Caltrans, the data from the Caltrans inspection are forward by the inspection technician to an inspector engineer. The engineer reviews the data, and if it shows that the foundation meets Caltrans' standards and criteria a report is prepared and signed by the engineer, with his professional registration number affixed to the report, and forwarded to the responsible engineer at the site indicating the foundation meets all standards. If the data indicates the foundation does not meet standards, the inspection engineer sends a report of his findings, without affixing the registration number, to the engineers in the field who then must work with the contractor to rectify the situation.

When using gamma-gamma testing, the raw data files cannot be manipulated; however, they can be downloaded to an analytical program, such as a spreadsheet, and then manipulated in way that allows the data to be falsified.

### **Bay Bridge and the Inspection Controversy**

The seismic retrofitting of the seven state owned toll bridges the Bay Area has had a tortuous history, especially in regard to the replacing the east span of the Bay Bridge. In 2001, legislation was enacted providing a funding scheme to address cost overruns on the seismic retrofit program. By August 2004, Caltrans reported that seismic retrofit program was facing a \$3.2 billion cost overrun, of which \$2.5 billion was attributable to the new east span. In March of 2005, Caltrans reported that the cost overrun had increased to \$3.6 billion. The entire increase was assigned to the Bay Bridge.

Legislation addressing the overrun issue, AB 144 (Hancock), Chapter 71 Statutes of 2005, included the creation of the Toll Bridge Program Oversight Committee. The committee is made up of the executive director of the Bay Area Toll Authority, the executive director of the California Transportation Commission, and the director of Caltrans. AB 144 requires Caltrans to report monthly to the Oversight Committee on a variety of topics related to the cost, schedule, and scope of the toll bridge projects. Specifically, Caltrans is to report, among other things, on the construction status, actual expenditures, forecasted costs, and any changes to design and construction schedules for the toll bridge retrofit program.

Every quarter the Oversight Committee is required to report to the CTC and the transportation and fiscal committee of the Senate and the Assembly on the status of the project. The mission of the Oversight Committee is as follows:

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<sup>2</sup> Gamma-gamma is a density measurement of the density of concrete piles that uses a source of gamma rays and a detector of gamma rays to record the density of the concrete. Crosshole sonic testing measures the density of a concrete pile by using a device that emits and records sounds waves that are reflected back from the pile.

The Toll Bridge Program Oversight Committee shall review project status, program costs, and schedules; resolve project issues; evaluate project changes; develop and regularly update cost estimates, *risk assessments*, and cashflow requirements for all phases of the toll bridge projects; and provide program direction.<sup>3</sup> (highlighting added)

### **Oversight Committee Not Informed of the Problems with the Bay Bridge Inspection**

For the Oversight Committee to perform its responsibilities, Caltrans must provide accurate and timely information on the activities associated with all aspects of the design and construction of the Bay Bridge and other toll bridge projects. Presumably, *risk assessment* would include a report to the Oversight Committee on inspection data that is incomplete or falsified on such an important element as the foundation for the tower. The chair of the Oversight Committee has indicated that he did not hear of the problems with the inspections until the publication of the *Bee's* article.

Clearly, Caltrans did not inform the Oversight Committee of any deficiencies in the inspections of the tower foundation or problems with Wiles. What is unknown is when Caltrans informed the chief of the toll bridge program and the Bay Bridge's project manager of the problems with the inspections.

The Toll Bridge Oversight Committee voted unanimously to convene its Seismic Safety Peer Review Committee to determine if the foundation for the tower of the new bridge is safe.

Several questions arise out of the chain of events surrounding the inspection of the foundation, including:

- Was a Caltrans inspection report sent to the Bay Bridge's project manager indicating that the foundation passed inspection?
- Was an inspection report on the Bay Bridge foundation based on Caltrans' inspection data produced by Wiles and others prepared by a Caltrans licensed engineer and forwarded to the Bay Bridge project manager?
- Was the anomalous information not identified at the time the inspection engineer prepared the inspection report?
- When did Caltrans inspectors inform the Bay Bridge's Project Managers of the incomplete Caltrans inspection data?

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<sup>3</sup> Streets and Highways Code Section 30952.1 (b).

## **Destruction of Data**

The *Bee* reported that Wiles destroyed much of the raw data he generated on foundation inspections. In addition, other technicians appear to have also destroyed data. Apparently, the destruction of data was not an uncommon practice, although Caltrans cannot describe its extent. In 2008, Caltrans established a policy that its inspectors were not to destroy raw data files. The *Bee* article implies that for about a year after the policy was promulgated the practice continued intermittently. According to the *Bee*, the manufacturer of the gamma-gamma testing instrument indicated that the retention of the raw data files is essential for any forensic analysis or reconstruction of a test.

If Caltrans did not have a policy of retaining raw data generated by its inspection technicians, like Wiles, on a complex, signature project such as the Bay Bridge, it is unlikely raw data files were retained on more numerous but less spectacular projects, such as foundations for freeway ramps and bridges, retaining walls, and columns that hold up information signs.

Caltrans apparently does not keep working files on its projects, or at least does not include the raw inspection data files in its files. Perhaps, at one time this was the policy because of space requirements, but with electronic storage available there is little reason for not retaining raw inspection data as well as other reports and data pertaining to a project. For purposes of responding to litigation in the event of a structure failure, construction claims, or other actions, it would be in Caltrans' self-interest to retain this information.

## **Attempted Cover-Up**

According to the *Bee*, Morgan in April 2010 informed by email Dolores Valls, deputy division chief for Geotechnical Services, that Liebich's exoneration of the Foundation Testing Branch is "a well-crafted misrepresentation" and that his conclusions are "unsupported by the facts." Evidently this assertion is based on the email sent by Liebich in January 2009 to Willian, stating that a cursory review by Morgan of thousands of data files created over two years exonerates the work of the Foundation Testing Branch. It is unclear how far up the chain of command the Liebich memo was distributed.

Geotechnical Support in which the foundation testing activity resides is part of the Division of Engineering Services. This division has several offices that develop design standards for highways and structures. A unit in the division is the Structure Construction Group. This group "works in partnership with districts and regions to provide construction engineering and quality assurance for construction projects throughout the State. . ." <sup>4</sup> The provision of quality

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<sup>4</sup> See <http://www.dot.ca.gov/hq/esc/construction/message.htm>. This site was accessed on November 20, 2011

assurance data would likely include information on the collection and dissemination of inspection data. It would be important, especially when a pattern of data falsification occurred or raw data was unavailable due to its destruction, to inform other units in the division, such as the Structure Construction Group, of the occurrence. How much lateral communication of this kind of information occurs is unknown.

### **The Susanville Cabin and the Foundation Inspection Branch**

During the debate within Caltrans regarding the quality of inspections within the Foundation Inspection Branch, Brian Liebich, the branch chief, was using some employees in the branch to assist in moving and fabricating state construction materials for use on his cabin in Susanville. This is an illegal activity. It is unclear if legal action has been taken against Liebich for this activity.

### **California Whistleblower Protection Act**

In 1993, the Legislature enacted the California Whistleblower Protection. Specifically, the statute provides for the following in Government Code Section 8547.3:

8547.3. (a) An employee may not directly or indirectly use or attempt to use the official authority or influence of the employee for the purpose of intimidating, threatening, coercing, commanding, or attempting to intimidate, threaten, coerce, or command any person for the purpose of interfering with the rights conferred pursuant to this article.

(b) For the purpose of subdivision (a), "use of official authority or influence" includes promising to confer, or conferring, any benefit; effecting, or threatening to effect, any reprisal; or taking, or directing others to take, or recommending, processing, or approving, any personnel action, including, but not limited to, appointment, promotion, transfer, assignment, performance evaluation, suspension, or other disciplinary action.

(c) Any employee who violates subdivision (a) may be liable in an action for civil damages brought against the employee by the offended party.

(d) Nothing in this section shall be construed to authorize an individual to disclose information otherwise prohibited by or under law.

This statute is administered by the Bureau of State Audits. It is important in regard to the issue of foundation inspections because one or more knowledgeable state employees circulated information to the oversight agencies and the *Bee*. This statute prohibits Caltrans from taking action against the employee in the event the identity is disclosed.